

Application No. 10/631,927
Amendment dated November 8, 2005
Reply to Office Action of August 9, 2005

Docket No. 1232-5091

REMARKS

Applicant respectfully requests reconsideration of this application in view of the foregoing amendment and following remarks.

Status of the Claims

Claims 21-32 are pending in this application. Claim 21 is independent. All of the pending claims stand rejected. By this amendment, claims 23 and 27 are cancelled. Claim 21 is amended. New claims 33-35 are added. No new matter has been added by this amendment.

Rejections under 35 U.S.C. §103

Claims 21-23 and 25-28 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 6,000,227 to Kroeker ("Kroeker"), in view of U.S. Patent No. 5,813,233 to Okuda et al. ("Okuda") and U.S. Patent No. 6,298,669 to Maruyama et al. ("Maruyama").

The Examiner indicates that "Kroeker discloses applicant's basic inventive concept, a cooling system provided in a vacuum atmosphere (abstract), comprising a radiational member (142, FIG. 7) spaced apart (col. 2, lines 45-47) from a rear surface of a cooled optical element (162, FIG. 7), substantially as claimed with the exception of a Peltier element ..."

Okuda is cited as disclosing a detector, a heat transfer system and a radiator block of the pending claims. Maruyama is cited as disclosing the Peltier element as shown in FIG. 7A as element 71.

It is necessary to form a large difference of temperature between an optical element and a radiation plate to absorb a heat from the optical element through radiation. As a result, it is necessary to maintain the temperature of the radiation plate considerably lower than the

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temperature of the optical element. See, for example, page 14, line 14 through page 15, line 10 of the original specification. However, if a coolant with a low-temperature is supplied to the radiation plate through a channel, the temperatures of vicinity components of the channel are also decreased causing the position of the optical element shifted thereby the performance of the optical system may be deteriorated.

One of the aspects of the present invention as featured in claim 21 is directed to a control system of a cooling apparatus that cools an optical element (e.g., a lens or a mirror) in a vacuum atmosphere where a Peltier element is contacted to a radiational member which is arranged apart from the optical element to be cooled. Specifically, the control system of claim 21 controls the heat transfer system contacted to the Peltier element in such a way that the temperature of the optical element is maintained substantially the same as the temperature of the coolant. Claim 21 has been amended to further clarify this aspect of the present invention. For example, amended claim 21 recites, *inter alia*, "wherein a temperature of the coolant is substantially the same as a temperature of the optical element."

With the aspect of the present invention as discussed above, the deterioration of the performance of the optical system, caused by the drastic difference of the temperatures between the radiation plate and the optical element, can be reduced. Moreover, as a result of the inventive aspect of present application, it is unnecessary to make the temperature of the coolant variable or remarkably low. See, e.g., line 7, page 24 - line 2, page 26 of the original specification.

Applicant believes that none of the cited references (i.g., Kroeker, Okuda and Murayama) shows or suggest this aspect of invention as discussed herein.

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Accordingly, claim 21 as amended is believed neither anticipated by nor rendered obvious in view of the cited references (i.e., Kroeker, Okuda and Murayama), either taken alone or in combination, for at least the reasons discussed above.

Reconsideration and withdrawal of the rejection of claim 21 under 35 U.S.C. §103(a) is respectfully requested.

Applicant has not individually addressed the rejections of the dependent claims because Applicant submits that the independent claims from which they respectively depend are in condition for allowance as set forth above. Applicant however reserves the right to address such rejections of the dependent claims should such be necessary.

New claims 33-35 have been added to recite the claimed invention in an alternative manner. Specifically, each of claims 33-35, in depending from claim 21 as amended, is believed to be allowable over the cited art of record for at least the similar reasons as discussed above for claim 21.

Applicant believes that the application as amended is in condition for allowance and such action is respectfully requested.

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AUTHORIZATION

No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicant hereby petitions the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 13-4500 (Order No. 1232-5091). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
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Dated: November 8, 2005

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